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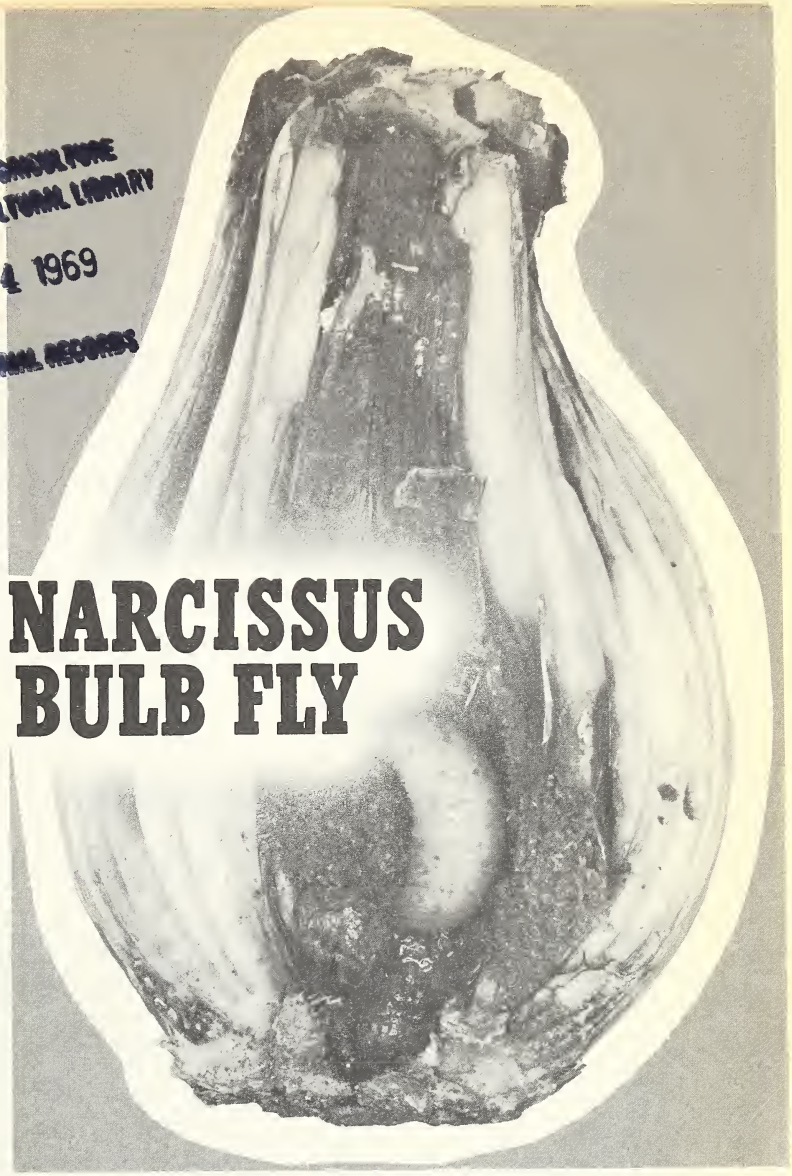

the NARCISSUS BULB FLY

how to prevent its damage in home gardens

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U.S. DEPARTMENT OF AGRICULTURE

the NARCISSUS BULB FLY

how to prevent its damage in home gardens

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The narcissus bulb fly[2] probably occurs wherever narcissus bulbs are grown in the United States. It may infest 20 to 30 percent of the bulbs in commercial plantings, and 50 to 75 percent of those in garden plantings.

This fly resembles a small bumble bee in color and general appearance. (A drawing of the adult female appears on the cover of this leaflet.)

DAMAGE TO BULBS

The female flies lay eggs on narcissus leaves. The larvae that hatch from these eggs migrate down the plants to the roots. They first feed on the basal plate, or growth center, of the bulb. Later they eat large cavities in the centers of the bulbs.

When the basal plate tissue is damaged, the bulb may be killed or its growth may be retarded. Small bulbs usually die. In large ones, enough base is left uninjured to allow some growth, but this tissue does not become normal again for 2 or 3 years. If the central area of the basal plate is destroyed, several small bulbs may develop around the undamaged edges. These bulbs take at least 2 years to reach normal size.

Injured bulbs produce only a small amount of foliage—often just a single leaf. This is the result of infestation the previous season.

[1] Retired.

[2] *Lampetia equestris.*

SIGNS OF INFESTATION

You can detect infested bulbs by examining the bases of bulbs during the summer months when they are out of the ground. Clean the soil and old roots away from the base with a knife or a small, stiff brush. A sunken brown area in the normally white root ring, at the edge of the basal plate, indicates that it has been attacked by a narcissus bulb fly maggot. Cut the brown spot out with a knife and you will see discoloration extending up the side and into the bulb.

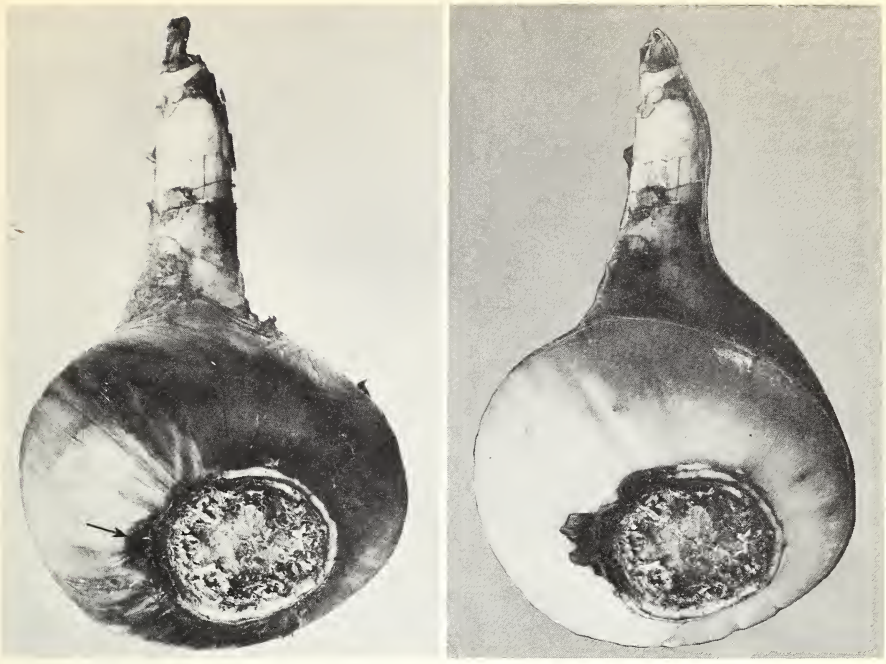
HOW THE FLY DEVELOPS

The narcissus bulb fly has four life stages—egg, larva (or maggot), pupa, and adult. There is normally one generation a year.

Egg.—The eggs are chalk-white, elongate oval, and about $\frac{1}{16}$ inch long. They can be seen on the leaves near the base of the plant, or in the soil.

Larva.—The eggs hatch in about 10 days. When newly hatched, the larvae are about $\frac{1}{15}$ inch long. They wriggle down through the soil at once, enter the bulbs through or near the roots, and develop during the summer and fall.

Usually only one larva is found in a bulb. Occasionally a larva will consume all the inside of the bulb before reaching maturity, and will attack another one.



BN—4971, BN—4972

Left: Dark, sunken part of the edge of the basal plate of a narcissus bulb indicates that the bulb is infested. Right: The same bulb with outer dried scales removed shows that discoloration extends into the living scale tissue.

ready to emerge, the fly pushes off the cap of the puparium, wriggles out, and climbs a nearby stem, where it spreads out and dries its wings.

Adult.—The adult is about ½ inch long. Its black body is covered with bands of long, colored hairs. These bands appear in combinations of black, yellow, orange, and buff, and give the flies many variations in color pattern.

The adults appear in late spring and early summer, and are most active on warm, sunny days. They fly in a zigzag fashion along rows of plants or among leaves, 8 to 10 inches above the ground, and produce a peculiar high-pitched hum. They feed for about a week before laying eggs. They feed on pollen and nectar from the blossoms of numerous fruits and flowers, including strawberry, apple, morning-glory, buttercup, and dandelion.

Each female lays 50 to 75 eggs singly on narcissus leaves at the ground level or as far below this level as she can. Occasionally eggs are deposited in the soil near the leaves. Since the flies prefer protected places, they usually do not lay their eggs on narcissus plantings in open, windswept areas.

HOW TO PROTECT BULBS

To keep this insect from damaging narcissus bulbs, take these steps:

1. Dust the bulbs with 6-percent chlordane before planting. Dust them again before covering them with soil.

BN–6017

An egg of the narcissus bulb fly on a narcissus leaf just above the surface of the ground.

While inside the bulb, the larva passes through three stages of development. In the first one, which lasts several weeks, it tunnels back and forth in the base of the bulb. In the second and third stages, the larva moves upward into the center of the bulb, enlarging the cavity as it grows. The mature larva remains inactive in the hollowed bulb through the winter.

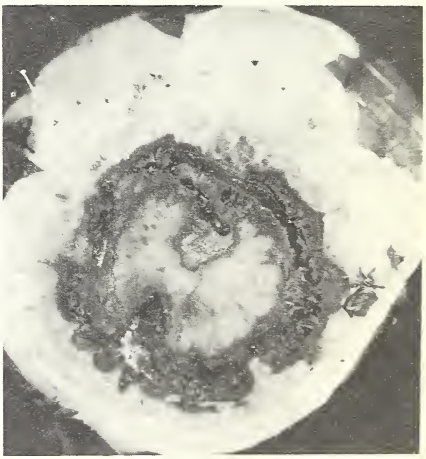
Each larva sheds its skin twice as it develops. Larvae are about ¾ inch long when fully grown. The dirty-tan body is plump, slightly arched, and nearly circular in cross section. It has a tough, wrinkled skin. The breathing tube at the hind end is almost black. Black mouth hooks in the slightly tapered head are used to tear bulb tissue. The larva contracts its body when it is handled; if its mouth hooks are touched it quickly draws them in almost out of sight.

Occasionally a larva may be retarded in development and remain small during the summer and fall. The next spring it will resume growing and will pass its second winter as a fully developed larva.

Pupa.—In early spring the larva leaves the bulb and moves near the surface of the soil. Its skin hardens and darkens, and the ends of its body become rounded. This larval skin becomes the pupal case, or puparium, within which the larva transforms into the pupa. Its tip barely shows above the surface of the soil.

Several days after the start of the pupal stage, two breathing tubes resembling horns emerge on the upper side of the puparium toward the front.

The larva changes to the adult fly during the pupal stage. When it is



BN–4969

Feeding tunnels in basal plate of a narcissus bulb.

BN—6019, BN—6018

Two stages in the destruction of a bulb by the narcissus bulb fly. Left: The basal part of the bulb has been seriously injured by the feeding of a maggot in its early stages. Right: A large part of the bulb has been eaten out by the maggot, which is now full grown.

BN—4970

Single leaves usually indicate that the bulbs from which they are developing have been practically destroyed by narcissus bulb fly maggots.

BN—3236X

Soil has been removed to reveal puparia of the narcissus bulb fly just below the surface of the ground.

2. Dig established plantings, destroy infested bulbs, and treat bulbs with chlordane dust before replanting.

3. In the spring, apply chlordane dust in foliage of established narcissus. Try to get the dust into soil cracks around plants and between leaves, to destroy young larvae that are attempting to descend to the bulbs.

PRECAUTIONS

Insecticides used improperly can be injurious to man and animals. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the labels.

Store insecticides in closed, well-labeled containers, in a dry place where they will not contaminate food or feed, and where children and pets cannot reach them.

Chlordane can be absorbed directly through the skin in harmful quantities. Keep it out of your eyes, nose, and mouth. If you spill any on your skin, wash it off immediately with soap and water. If you spill it on your clothing, remove the clothing immediately and wash the skin thoroughly. Launder the clothing before wearing it again.

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